PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY
(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference PE17716PC00	**FOR FURTHER ACTION** See Form PCT/IPEA/416	
International application No. PCT/SE 2003/001261	International filing date *(day/month/year)* 08-08-2003	Priority date *(day/month/year)* 01-04-2003

International Patent Classification (IPC) or national classification and IPC
H04L12/24, H04L12/28, H04L12/66

Applicant
Telefonaktiebolaget LM Ericsson (publ) et al

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1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of **3** sheets, including this cover sheet.

3. This report is also accompanied by ANNEXES, comprising:

   a. ☒ *(sent to the applicant and to the International Bureau)* a total of **8** sheets, as follows:

      ☒ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).

      ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.

   b. ☐ *(sent to the International Bureau only)* a total of (indicate type and number of electronic carrier(s))
   _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

   ☒ Box No. I — Basis of the report

   ☐ Box No. II — Priority

   ☐ Box No. III — Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

   ☐ Box No. IV — Lack of unity of invention

   ☒ Box No. V — Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

   ☐ Box No. VI — Certain documents cited

   ☐ Box No. VII — Certain defects in the international application

   ☐ Box No. VIII — Certain observations on the international application

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Date of submission of the demand 08-10-2004	Date of completion of this report 25-02-2003
Name and mailing address of the IPEA/SE Patent- och registreringsverket Box 5055 S-102 42 STOCKHOLM Facsimile No. +46 8 667 72 88	Authorized officer Ralf Boström/MN Telephone No. +46 8 782 25 00

Form PCT/IPEA/409 (cover sheet) (January 2004)

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/SE 2003/001261

Box No. I   **Basis of the report**

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

    ☐ This report is based on a translation from the original language into the following language _____ , which is the language of a translation furnished for the purposes of:

    ☐ international search (under Rules 12.3 and 23.1(b))

    ☐ publication of the international application (under Rule 12.4)

    ☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the **elements** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report):*

    ☐ the international application as originally filed/furnished

    ☒ the description:

    pages   **1-34** _____ as originally filed/furnished

    pages* _____ received by this Authority on _____

    pages* _____ received by this Authority on _____

    ☒ the claims:

    pages _____ as originally filed/furnished

    pages* **40-45** _____ as amended (together with any statement) under Article 19

    pages* _____ received by this Authority on _____

    pages* _____ received by this Authority on _____

    ☒ the drawings:

    pages   **1-10** _____ as originally filed/furnished

    pages* _____ received by this Authority on _____

    pages* _____ received by this Authority on _____

    ☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

    ☐ the description, pages _____

    ☐ the claims, Nos. _____

    ☐ the drawings, sheets/figs _____

    ☐ the sequence listing *(specify)*: _____

    ☐ any table(s) related to the sequence listing *(specify)*: _____

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

    ☐ the description, pages _____

    ☐ the claims, Nos. _____

    ☐ the drawings, sheets/figs _____

    ☐ the sequence listing *(specify)*: _____

    ☐ any table(s) related to the sequence listing *(specify)*: _____

*   *If item 4 applies, some or all of those sheets may be marked "superseded."*

Form PCT/IPEA/409 (Box No. I) (January 2004)

Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1-24	YES
	Claims	---	NO
Inventive step (IS)	Claims	1-24	YES
	Claims	---	NO
Industrial applicability (IA)	Claims	1-24	YES
	Claims	---	NO

2. Citations and explanations (Rule 70.7)

Documents cited in the International Search Report:

D1. US 6353614 B1
D2. US 2002/024959 A1

The cited documents represent the general state of the art. The invention defined in claims 1-24 is not disclosed by any of these documents. The cited prior art does not give any indication that would lead a person skilled in the art to the claimed method of allocating network addresses. Therefore, the claimed invention is not obvious to a person skilled in the art. Accordingly, the invention defined in claims 1-24 is novel and is considered to involve an inventive step. The invention is industrially applicable.

PATENT COOPERATION TREATY

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From the INTERNATIONAL BUREAU 1·2 -11- 2004

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NOTIFICATION CONCERNING AMENDMENTS OF THE CLAIMS

(PCT Rule 62 and Administrative Instructions, Section 417)

To:

Swedish Patent Office
P.O. Box 5055
S-102 42 Stockholm
Sweden

in its capacity as International Preliminary Examining Authority

Date of mailing (day/month/year) 28 October 2004 (28.10.2004)	

International application No. PCT/SE2003/001261	International filing date (day/month/year) 08 August 2003 (08.08.2003)

Applicant

TELEFONAKTIEBOLAGET LM ERICSSON (publ) et al

The International Bureau hereby transmits a copy of the amendments to the claims under Article 19 together with any accompanying statement (Rule 62).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer Rodolfo CLEMENTE
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Form PCT/IB/337 (July 1998)

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AMENDED CLAIMS
[received by the International Bureau on 16 January 2004 (16.01.04);
original claims 1-24 replaced by amended claims 1-24 (6 pages)]

CLAIMS

1.   A method for enabling establishment of a connection between a node of an inside address realm and a node of an outside address realm through an intermediate
5   communication gateway having a pool of outside-realm gateway addresses for outside-realm representation of inside-realm nodes, said method comprising the steps of:
-    centrally allocating, in response to a configuration request initiated from said inside-realm node, an outside-realm gateway address from said pool of gateway addresses and an inside node port number for said inside-realm node,
10   wherein said step of centrally allocating comprises the step of identifying, based on predetermined connection information derivable from said configuration request, an outside-realm gateway address and an inside node port number that in combination with said predetermined connection information define an outside-realm gateway state representation that has no counterpart in any existing gateway connection state;
15   -   initiating establishment of said connection at least partly based on the allocated outside-realm gateway address and inside node port number; and
-    transmitting the allocated outside-realm gateway address and inside node port number to the requesting inside-realm node in a configuration reply.

20   2.   The method according to claim 1, wherein said predetermined connection information includes at least one of outside node address information and outside node port information.

3.   The method according to claim 1, wherein a gateway connection state is established
25   in said gateway based on said outside-realm gateway state representation and a representation of an inside-realm routing path between said gateway and said inside-realm node.

4.   The method according to claim 1, wherein the allocated outside-realm gateway
30   address and inside node port number are represented by an allocated socket network

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address and a source port number, and the predetermined connection information includes a destination network address and a destination port number, and the outside-realm gateway state representation is defined by a unique set of socket parameters including the allocated socket network address and source port number, the destination

5   network address and the destination port number.

5.   The method according to claim 1, wherein said configuration reply is a DNS (Domain Name Server) reply.

10   6.   The method according to claim 5, wherein said allocated outside-realm gateway address and inside node port number are conveyed in a dedicated DNS record in said DNS reply.

7.   The method according to claim 1, further comprising the step of said inside-realm

15   node configuring a communication interface according to said allocated outside-realm gateway address and inside node port number.

8.   The method according to claim 1, further comprising the step of establishing an inside-realm routing path between said gateway and said inside-realm node.

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9.   A system for enabling establishment of a connection between a node of an inside address realm and a node of an outside address realm through an intermediate communication gateway having a pool of outside-realm gateway addresses for outside-realm representation of inside-realm nodes, said system comprising:

25   -   means for centrally allocating, in response to a configuration request initiated from said inside-realm node, an outside-realm gateway address from said pool of gateway addresses and an inside node port number for said inside-realm node, wherein said means for centrally allocating comprises means for identifying, based on predetermined connection information derivable from said configuration request, an

30   outside-realm gateway address and an inside node port number that in combination with

said predetermined connection information define an outside-realm gateway state representation that has no counterpart in any existing gateway connection state;

  - means for initiating establishment of said connection at least partly based on the allocated outside-realm gateway address and inside node port number; and

5 - means for transmitting the allocated outside-realm gateway address and inside node port number to the requesting inside-realm node in a configuration reply.

10. The system according to claim 9, wherein said predetermined connection information includes at least one of outside node address information and outside node

10 port information.

11. The system according to claim 9, wherein a gateway connection state is established in said gateway based on said outside-realm gateway state representation and a representation of an inside-realm routing path between said gateway and said inside-

15 realm node.

12. The system according to claim 9, wherein the allocated outside-realm gateway address and inside node port number are represented by an allocated socket network address and a source port number, and the predetermined connection information

20 includes a destination network address and a destination port number, and the outside-realm gateway state representation is defined by a unique set of socket parameters including the allocated socket network address and source port number, the destination network address and the destination port number.

25 13. The system according to claim 9, wherein said configuration reply is a DNS (Domain Name Server) reply.

14. The system according to claim 13, wherein said allocated outside-realm gateway address and inside node port number are conveyed in a dedicated DNS record in said

30 DNS reply.

15.   The system according to claim 9, further comprising means for establishing an inside-realm routing path between said gateway and said inside-realm node.

16.   A gateway resource manager for a communication gateway, said communication gateway having a pool of outside-realm gateway addresses for outside-realm representation of inside-realm nodes, said gateway resource manager comprising:

   -   means for allocating an outside-realm gateway address from said pool of gateway addresses and an inside node port number to be used in establishing a gateway connection state for a flow between an inside-realm node and an outside-realm node,

   wherein said allocating means comprises means for identifying, based on predetermined connection information, an outside-realm gateway address and an inside node port number that in combination with said predetermined connection information define an outside-realm gateway state representation that has no counterpart in any existing gateway connection state;

   -   means for initiating establishment of said gateway connection state at least partly based on the allocated outside-realm gateway address and inside node port number; and

   -   means for transmitting the allocated outside-realm gateway address and inside node port number to said inside-realm node.

17.   The gateway resource manager according to claim 16, wherein said predetermined connection information includes at least one of outside node address information and outside node port information.

18.   The gateway resource manager according to claim 16, wherein the allocated outside-realm gateway address and inside node port number are represented by an allocated socket network address and a source port number, and the predetermined connection information includes a destination network address and a destination port number, and the outside-realm gateway state representation is defined by a unique set of

socket parameters including the allocated socket network address and source port number, the destination network address and the destination port number.

19.   The gateway resource manager according to claim 16, wherein said means for
5   initiating establishment of said gateway connection state comprises means for requesting that said gateway establishes a gateway connection state based on said outside-realm gateway state representation and a representation of an inside-realm routing path between said gateway and said inside-realm node.

10   20.   The gateway resource manager according to claim 16, wherein said allocating means performs allocation in response to a configuration request initiated from said inside-realm node, and said transmitting means transmits the allocated outside-realm gateway address and inside node port number to said inside-realm node in a configuration reply.

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21.   The gateway resource manager according to claim 20, wherein said configuration reply is a DNS (Domain Name Server) reply.

22.   The gateway resource manager according to claim 21, wherein said allocated
20   outside-realm gateway address and inside node port number are conveyed in a dedicated DNS record in said DNS reply.

23.   A method of configuring an inside-realm communication node for communication with an outside-realm communication node via a communication gateway having a pool
25   of outside-realm gateway addresses for outside-realm representation of inside-realm nodes, said method comprising the steps of:
        -   centrally allocating an outside-realm gateway address from said pool of gateway addresses and an inside node port number for said inside-realm node,
            wherein said step of centrally allocating comprises the step of identifying, based on
30   predetermined connection information, an outside-realm gateway address and an inside

node port number that in combination with said predetermined connection information define an outside-realm gateway state representation that has no counterpart in any existing gateway connection state;

 - transmitting the allocated outside-realm gateway address and inside node port
5 number to said inside-realm node; and

 - configuring said inside-realm communication node according to the allocated outside-realm gateway address and inside node port number.

24. An inside-realm communication terminal arranged for communication with any of
10 a number of outside-realm hosts via a communication gateway having a pool of outside-realm gateway addresses for enabling outside-realm representation of inside-realm communication terminals, said communication terminal comprising:

 - means for requesting, in a modified DNS (Domain Name Server) query, central configuration for communication with a selected one of said outside-realm hosts;

15 - means for receiving a DNS configuration reply including an allocated outside-realm gateway address and an allocated terminal port number, said allocated outside-realm gateway address and said allocated terminal port number being arranged in a dedicated DNS record in said configuration reply;

 - means for configuring a communication interface according to said outside-
20 realm gateway address and said terminal port number.